

Access DB# 108360

## SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: Lyvette Vanez - Ennis Examiner #: 74987 Date: 11/17/03  
Art Unit: \_\_\_\_\_ Phone Number 301-6504 Serial Number: 10102348  
Mail Box and Bldg/Room Location: CP 3 10E2 Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

\*\*\*\*\*

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched.

Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: \_\_\_\_\_

Inventors (please provide full names): \_\_\_\_\_

17

Earliest Priority Filing Date: \_\_\_\_\_

*\*For Sequence Searches Only\* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.*

## STAFF USE ONLY

Searcher: <u>John Cane</u>	Type of Search	Vendors and cost where applicable
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Date Searcher Picked Up: <u>11/14/03</u>	Structure (#) _____	Questel/Orbit _____
Date Completed: <u>11/14/03</u>	Bibliographic <input checked="" type="checkbox"/>	Dr.Link _____
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	Other _____	Other (specify) _____



# STIC Search Report

EIC 1700

STIC Database Tracking Number: 108360

TO: Lynette T Umez-Eronini  
Location: CP3 10E12  
Art Unit : 1765  
November 17, 2003

Case Serial Number: 10/023948

From: John Calve  
Location: EIC 1700  
CP3/4-3D62  
Phone: 308-4139

[John.Calve@uspto.gov](mailto:John.Calve@uspto.gov)

## Search Notes

Lynette,

I searched Chemical Abstracts, Derwent, Japio, Compendex, and inspec files. I found very little art. Even when I broadened my search to choline?and polish? I didn't get many answers that were relevant to these claims.

I left you some comments on the printout. If you have any questions, please feel free to call me.

John 308-4139



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☐ TC 2800 ☐ TC 3600 ☐ TC 3700 ☐ Other

#### Enter your Contact Information below:

Name:

LYNETTE T. UMEZ-ERONINI

Employee Number: 74987

Phone:

306-9074

Art Unit or Office: CP3

Building & Room Number:

10E12

Enter the case serial number (Required): 10/023948

If not related to a patent application, please enter NA here.

Class / Subclass(es) 252/79.1, 739.4 AND 438/692

Earliest Priority Filing Date: 12/21/2001

#### Format preferred for results:

☒ Paper ☐ Diskette ☐ E-mail

#### Provide detailed information on your search topic:

- In your own words, describe in detail the concepts or subjects you want us to search.
- Include synonyms, keywords, and acronyms. Define terms that have special meanings.
- \*For Chemical Structure Searches Only\*  
Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers

- **\*For Sequence Searches Only\***  
Include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.
- **\*For Foreign Patent Family Searches Only\***  
Include the country name and patent number.
- Provide examples or give us relevant citations, authors, etc., if known.
- FAX or send the **abstract, pertinent claims** (not all of the claims), **drawings, or chemical structures** to your EIC or branch library.

**Enter your Search Topic Information below:**

Search "choline chloride" in a cmp or "chemical mechanical" polishing or planarization or planarizing process or method in claim 1.

CLAIM 1. A polishing slurry, comprising: an abrasive; deionized water; a pH controlling agent; choline chloide and polyethylene imine having a molecular structure of  $[--CH.sub.2CH.sub.3N(CH.sub.2CH.sub.2NH.sub.2)--]_x[--CH.sub.2CH.sub.2N$  where x and y are positive integers.

FYI: The polishing slurry of claim 3, wherein the choline derivative is one selected from the group consisting of choline chloride, choline base, cholinebromide, choline iodide, choline dihydrogen citrate, choline bitartrate, choline bicarbonate, choline citrate, choline ascorbate, choline borate, choline theophyllinate, choline gluconate, acetylcholine chloride, acetylcholine bromide, and methacholine chloride.

9. The polishing slurry of claim 4, wherein the choline derivative is one selected from the group consisting of choline chloride, choline base, choline bromide, choline iodide, choline dihydrogen citrate, choline bitartrate, choline bicarbonate, choline citrate, choline ascorbate, choline borate, choline theophyllinate, choline gluconate, acetylcholine chloride, acetylcholine bromide, and methacholine chloride.

**Special Instructions and Other Comments:**

(For fastest service, let us know the best times to contact you, in case the searcher needs further clarification on your search.)

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Last Modified: Thursday, July 24, 2003 15:31:52

=> file hca

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FILE COVERS 1907 - 13 Nov 2003 VOL 139 ISS 21  
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=> d his

(FILE 'HOME' ENTERED AT 08:58:35 ON 17 NOV 2003)

FILE 'HCA' ENTERED AT 08:58:57 ON 17 NOV 2003  
E US20020123224/PN

L1 1 S E3  
SEL L1 RN

FILE 'REGISTRY' ENTERED AT 08:59:21 ON 17 NOV 2003

L2 3 S E1-E3  
E CHOLINE CHLORIDE/CN  
E CHOLINE BROMIDE/CN  
E POLYETHYLENE BROMIDE/CN  
E POLYETHYLENE IMINE/CN

FILE 'LCA' ENTERED AT 09:01:40 ON 17 NOV 2003

FILE 'REGISTRY' ENTERED AT 09:06:05 ON 17 NOV 2003  
E CHOLINE CHLORIDE/CN

L3 1 S E3

FILE 'HCA' ENTERED AT 09:06:40 ON 17 NOV 2003

L4 1758 S L3  
L5 3960 S CHOLINE#(N) (CHLORIDE#)  
L6 4376 S L4 OR L5  
L7 87004 S CMP OR POLISH? OR PLANARIS? OR PLANARIZ?  
L8 12 S L6 AND L7  
L9 1209780 S 76/SX,SC  
L10 2 S L8 AND L9

FILE 'LCA' ENTERED AT 09:10:08 ON 17 NOV 2003  
L11 12 S CHOLINE#(N)(BROMIDE# OR IODIDE# OR CITRATE## OR BITARTRATE# O  
L12 124 S CHOLINE#  
L13 300 S CHOLINE?  
L14 0 S (POLYETHYLENE# OR POLY#(W)ETHYLENE#) (N) IMINE#  
L15 69 S IMINE#  
L16 971 S (POLYETHYLENE# OR POLY#(W)ETHYLENE#)  
L17 4882 S PH OR ACIDIT? OR ACIDIT? OR BASIC? OR BASICIT?

FILE 'HCA' ENTERED AT 09:15:44 ON 17 NOV 2003  
L18 3052 S L11  
L19 46816 S L12  
L20 100013 S L13  
L21 405 S L14  
L22 23452 S L15  
L23 340500 S L16  
L24 69602 S SEMINCONDUCT? OR VLSI# OR ULSI# OR WAFER?  
L25 4 S L18 AND L7  
L26 17 S L4 AND (L24 OR L9)  
L27 27181 S POLISHING/IT  
L28 2 S L26 AND L27  
L29 5 S L11 AND L24  
L30 2 S L29 AND L9  
L31 0 S L29 AND (L21 OR L22 OR PE)  
L32 47958 S (L21 OR L22 OR PE)  
L33 0 S L26 AND L32  
L34 240 S L19 AND L7  
L35 5 S L34 AND L32  
L36 1 S L35 AND L9  
L37 8 S L10 OR L25 OR L28 OR L30 OR L36  
L38 94594 S SLURR?  
L39 2 S L37 AND L38  
L40 1 S L8 AND L38  
L41 4 S (L37 OR L39 OR L40) AND (L17 OR PH)  
L42 44304 S L17(2N)(CONTROLL? OR REGULAT? OR CHANG? OR FIX###)  
L43 164 S L19 AND L9  
L44 3 S L43 AND L42  
L45 168 S L20 AND L9  
L46 3 S L45 AND L42  
L47 10 S L37 OR L39 OR L41 OR L44 OR L46  
L48 1 S L47 AND L1  
L49 4654 S SAMSUNG?/PA  
L50 0 S L47 AND L49  
L51 4654 S SAMSUNG/PA  
L52 9 S L47 NOT L48  
L53 7 S L52 AND 1907-2001/PY, PRY  
L54 2 S L52 NOT L53

FILE 'WPIX' ENTERED AT 09:29:34 ON 17 NOV 2003  
L55 459 S L5  
L56 66251 S L7  
L57 144 S L11  
L58 3953 S L12  
L59 5530 S L13  
L60 2 S L55 AND L56  
L61 301548 S L17  
L62 14634 S L61(2N)(CONTROL? OR REGULAT? OR CHANG? OR FIX?)  
L63 36 S L59 AND L62  
L64 2 S L63 AND L7

L65 3 S L60 OR L64  
L66 64992 S SLURR?  
L67 2 S L65 AND L66

FILE 'JAPIO' ENTERED AT 09:33:44 ON 17 NOV 2003

L68 58 S L5  
L69 41257 S L7  
L70 0 S L68 AND L69  
L71 860 S L13  
L72 5 S L71 AND L69  
L73 29180 S SLURR?  
L74 0 S L72 AND L73  
L75 98816 S L17  
L76 1 S L72 AND L75  
L77 67082 S L24 OR VLSI  
L78 1 S L72 AND L77  
L79 5 S L72 OR L76 OR L78

FILE 'INSPEC, COMPENDEX' ENTERED AT 09:37:38 ON 17 NOV 2003

L80 1444 S L13  
L81 52587 S L7  
L82 4 S L80 AND L81

\*\*\*\*\*  
This is the author's record.

\*\*\*\*\*  
=> d L48 1 cbib abs hitind

L48 ANSWER 1 OF 1 HCA COPYRIGHT 2003 ACS on STN  
137:209428 Chemical mechanical **polishing slurry**. Lee,  
Jae-dong; Yoon, Bo-un; Hah, Sang-rok (S. Korea). U.S. Pat. Appl. Publ. US  
2002123224 A1 20020905, 10 pp. (English). CODEN: USXXCO. APPLICATION:  
US 2001-23948 20011221. PRIORITY: KR 2000-80715 20001222.  
AB A **polishing slurry** including an abrasive, deionized  
water, a **pH controlling agent**, and  
**polyethylene imine**, can control the removal rates of a  
silicon oxide layer and a silicon nitride layer which are simultaneously  
exposed during chemical mech. **polishing (CMP)** of a  
conductive layer. A relative ratio of the removal rate of the silicon  
oxide layer to that of the silicon nitride layer can be controlled by  
controlling an amount of the **choline** derivative  
IC ICM H01L021-302  
ICS H01L021-461  
NCL 438689000  
CC 76-3 (Electric Phenomena)  
ST chem mech **polishing slurry**  
IT Abrasives  
Slurries  
pH  
(chemical mech. **polishing slurry** containing abrasive,  
deionized water, **pH controlling agent**, and  
**polyethylene imine**)  
IT **Polishing**  
(chemical-mech.; chemical mech. **polishing slurry** containing  
abrasive, deionized water, **pH controlling agent**,  
and **polyethylene imine**)

- IT 9002-98-6  
RL: DEV (Device component use); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)  
(chemical mech. **polishing slurry** containing abrasive, deionized water, **pH controlling agent**, and **polyethylene imine**)
- IT 7631-86-9, Silica, processes 12033-89-5, Silicon nitride, processes  
RL: DEV (Device component use); REM (Removal or disposal); PROC (Process); USES (Uses)  
(control of removal rates of silicon oxide layer and silicon nitride layer simultaneously exposed during chemical mech. **polishing**)

=> d L53 1 cbib abs hitind hitrn

L53 ANSWER 1 OF 7 HCA COPYRIGHT 2003 ACS on STN

- 136:410105 Semiconductor **wafer polishing slurry** using quaternary ammonium salts and chemical mechanical **polishing** method using. Lee, Jae-dong; Lee, Jong-won; Yoon, Bo-un; Hah, Sang-rok (S. Korea). U.S. Pat. Appl. Publ. US 20020064955 A1 20020530, 8 pp. (English). CODEN: USXXCO. APPLICATION: US 2001-977239 20011016. PRIORITY: KR 2000-60704 20001016.
- AB A chemical mech. **polishing slurry** includes an additive of a quaternary ammonium compound of {N-(R1R2R3R4)}X-, in which R1, R2, R3, and R4 are radicals, and X-is an anion derivative including halogen elements. Preferably, the quaternary ammonium compound is one of [Me3NCH2CH2OH]Cl, [Me3NCH2CH2OH]I, [Me3NCH2CH2OH]Br, [Me3NCH2CH2H]CO3, and mixts. thereof. The **slurry** may further include a **pH control agent** formed of a base such as KOH, NH4OH, and Me4NOH, and an acid such as HCl, H2SO4, H3PO4, and HNO3. Also, the **pH control agent** can include [Me3NCH2CH2OH]OH. The **slurry** may further include a surfactant such as cetyldimethylammonium bromide, polyethylene oxide, polyethylene alc. or polyethylene glycol.
- IC ICM H01L021-461  
NCL 438691000  
CC 76-3 (Electric Phenomena)  
Section cross-reference(s): 66  
ST quaternary ammonium compd chem mech **polishing slurry** semiconductor  
IT **Polishing**  
(chemical-mech.; semiconductor **wafer polishing slurry** using quaternary ammonium salts and chemical mech. **polishing** method using)
- IT **Slurries**  
(semiconductor **wafer polishing slurry** using quaternary ammonium salts and chemical mech. **polishing** method using)
- IT Polyoxyalkylenes, uses  
Quaternary ammonium compounds, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(semiconductor **wafer polishing slurry** using quaternary ammonium salts and chemical mech. **polishing** method using)
- IT 7631-86-9, Silicon dioxide, processes 12033-89-5, Silicon nitride, processes  
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)  
(semiconductor **wafer polishing slurry** using quaternary ammonium salts and chemical mech. **polishing**)



- method using)
- IT 62-49-7D, Choline, derivs. 67-48-1, **Choline chloride** 75-59-2, Tetramethylammonium hydroxide 123-41-1, Choline hydroxide 1310-58-3, Potassium hydroxide (KOH), uses 1336-21-6, Ammonium hydroxide 1927-06-6 7647-01-0, Hydrogen chloride, uses 7664-38-2, Phosphoric acid, uses 7664-93-9, Sulfuric acid, uses 7697-37-2, Nitric acid, uses 17773-10-3 25322-68-3, Polyethylene oxide 59612-50-9
- RL: TEM (Technical or engineered material use); USES (Uses)  
(semiconductor **wafer polishing slurry**  
using quaternary ammonium salts and chemical mech. **polishing**  
method using)
- IT 67-48-1, **Choline chloride**
- RL: TEM (Technical or engineered material use); USES (Uses)  
(semiconductor **wafer polishing slurry**  
using quaternary ammonium salts and chemical mech. **polishing**  
method using)

=> d L53 2-7 cbib abs hitind hitrn

- L53 ANSWER 2 OF 7 HCA COPYRIGHT 2003 ACS on STN
- 136:272267 Ionic liquids and their use. Abbott, Andrew Peter; Davies, David Lloyd; Capper, Glen; Rasheed, Raymond Kelvin; Tambyrajah, Vasuki (Scionix Limited, UK). PCT Int. Appl. WO 2002026381 A2 20020404, 40 pp.
- DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, MF, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2001-GB4306 20010926. PRIORITY: GB 2000-23708 20000927.
- AB Ionic compds. having a f.p. of no more than 50 °C, formed by the reaction of at least one amine salt of the formula R1R2R3R4N+X- (I) with at least one hydrated salts, which is a chloride, nitrate, sulfate or acetate of Li, Mg, Ca, Cr, Mn, Fe, Co, Ni, Cu, Zn, Cd, Pb, Bi, La or Ce; wherein R1, R2 and R3 are each independently a C1 to C5 alkyl or a C6 to C10 cycloalkyl group, or wherein R2 and R3 taken together represent a C4 to C10 alkylene group, thereby forming with the N atom of formula (I) a 5 to 11 membered heterocyclic ring, and wherein R4 is hydrogen, or Ph, or C1 to C12 alkyl or cycloalkyl group, optionally substituted with at least one group selected from OH, Cl, Br, F, I, Ph, NH2, CN, NO2, COOR5, CHO, COR5 and OR5, wherein R5 is a C1 to C10 alkyl or cycloalkyl group, and X- is an anion capable of being complexed by the said hydrated salt. The compds. are useful as solvents, electrolytes, and catalysts, and have particular application in solvents/electrolytes for metal plating and electropolishing processes, in particular in chromium plating.
- IC ICM B01J031-00
- CC 78-3 (Inorganic Chemicals and Reactions)  
Section cross-reference(s): 23, 25, 56, 71, 76
- IT **Polishing**  
(electrochem.; of aluminum in ionic liqs. formed by reaction of amine salt with hydrated salts)
- IT 67-48-1, **Choline chloride** 10060-12-5,  
Chromium trichloride hexahydrate
- RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)

- (ionic liqs. formed by reaction of amine salt of formula  $R_1R_2R_3R_4N+X-$  with hydrated salts)
- IT 67-48-1, **Choline chloride**  
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)  
(ionic liqs. formed by reaction of amine salt of formula  $R_1R_2R_3R_4N+X-$  with hydrated salts)
- L53 ANSWER 3 OF 7 HCA COPYRIGHT 2003 ACS on STN
- 132:86717 Post etch cleaning composition and process for a dual damascene system in integrated circuit fabrication. Payne, Catherine M.; Maloney, David J.; Lee, Shihying; Lee, Wai Mun; Arkless, Leslie W. (EKC Technology, Inc., USA). PCT Int. Appl. WO 200002238 A1 20000113, 47 pp.  
DESIGNATED STATES: W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG. (English). CODEN: PTXXD2. APPLICATION: WO 1999-US15157 19990702. PRIORITY: US 1998-92024 19980706.
- AB A cleaning composition based on a choline compound, such as choline hydroxide,  
is provided to address the problem of dual damascene fabrication. An inorg. etch stop layer at the bottom of a dual damascene structure protects the underlying Cu interconnect and allows better cleaning. A 2-step etching process using the etch stop layer is used to achieve the requirements of ULSI manufacture in a dual damascene structure.
- IC ICM H01L021-02  
ICS H01L021-44; H01L021-28; C09K013-00; C23F011-167; C23F011-14
- CC 76-3 (Electric Phenomena)
- ST cleaning compn process dual damascene system; integrated circuit fabrication cleaning compn process; inorg etch stop layer dual damascene system; ULSI manuf cleaning compn process
- IT 57-55-6, Propylene glycol, processes 67-48-1, Choline chloride 67-68-5, DMSO, processes 78-73-9, **Choline bicarbonate** 123-41-1, Choline hydroxide 141-43-5, Monoethanolamine, processes 929-06-6, Diglycolamine 7732-18-5, Water, processes 7803-49-8, Hydroxylamine, processes 7803-49-8D, Hydroxylamine, salts, processes  
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)  
(post etch cleaning composition for a dual damascene system containing)
- L53 ANSWER 4 OF 7 HCA COPYRIGHT 2003 ACS on STN
- 131:206980 Resist development method using pH-controlled developer and rinsing water. Kitazawa, Kozo (Kao Corp., Japan). Jpn. Kokai Tokkyo Koho JP 11249323 A2 19990917 Heisei, 4 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1998-53653 19980305.
- AB The method comprises a developing process using aqueous alkaline developer  
with pH 9-15 and a rinsing process using rinsing water with pH (-1)-6. Resist patterns with high accuracy are obtained in high yield and the method is useful for manufacture of semiconductor devices.
- IC ICM G03F007-32  
ICS G03F007-32
- CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)  
Section cross-reference(s): 76

- ST resist developer **pH controlled**; rinsing water resist development
- IT Resists  
(resist developing method using **pH-controlled** developer and rinsing water)
- IT 7732-18-5, Water, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(electrolyzed; resist developing method using **pH-controlled** developer and rinsing water)
- IT 62-49-7, Choline 75-59-2, Tetramethylammonium hydroxide  
RL: TEM (Technical or engineered material use); USES (Uses)  
(resist developing method using **pH-controlled** developer and rinsing water)
- IT 104-15-4, p-Toluenesulfonic acid, uses 463-79-6, Carbonic acid, uses 526-95-4, Gluconic acid 7783-20-2, Ammonium sulfate, uses  
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)  
(rinsing water containing; resist developing method using **pH-controlled** developer and rinsing water)
- L53 ANSWER 5 OF 7 HCA COPYRIGHT 2003 ACS on STN
- 130:319560 Compositions and method for cleaning of semiconductor substrates or elements. Kitazawa, Kozo; Horio, Yasunori (Kao Corp., Japan). Jpn. Kokai Tokkyo Koho JP 11116984 A2 19990427 Heisei, 17 pp. (Japanese).  
CODEN: JKXXAF. APPLICATION: JP 1997-288553 19971021.
- AB Title comps. showing low foaming properties, contain compds. with  $\geq 2$  phosphonic acid groups, and optionally p-R1C6H4(CH2)nO(AO)mX (R1 = H, C1-5 alkyl, C2-5 alkenyl; AO = ethylene oxide, propylene oxide; X = H, C1-4 alkyl or acyl; n = 0-2; m = 1-8) and/or R2O(AO)mX (R2 = C1-6 alkyl, C2-6 alkenyl, C1-6 acyl; AO = same as above; X = H, C1-4 alkyl or acyl; m = 1-8). The comps. may further contain nonionic surfactants and **pH controlling** agents. Thus, aqueous solution (pH 7.5) of 0.1% ammonium 1-hydroxyethylidene-1,1-diphosphonate effectively removed fine particles and oily soil from SiO2 particles.
- IC ICM C11D001-12  
ICS C11D010-02; H01L021-304; C11D001-12; C11D001-66; C11D007-26
- CC 76-3 (Electric Phenomena)  
Section cross-reference(s): 46
- IT Alcohols, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(amino, **pH controlling** agent; comps. containing phosphonate group-containing compds. for cleaning of semiconductor substrates or elements)
- IT 62-49-7, Choline 64-18-6, Formic acid, uses 64-19-7, Acetic acid, uses 75-59-2, Tetramethylammonium hydroxide 1310-58-3, Potassium hydroxide, uses 7647-01-0, Hydrochloric acid, uses 7664-39-3, Hydrofluoric acid, uses 7664-41-7, Ammonia, uses 7664-93-9, Sulfuric acid, uses 7697-37-2, Nitric acid, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(**pH controlling** agent; comps. containing phosphonate group-containing compds. for cleaning of semiconductor substrates or elements)
- L53 ANSWER 6 OF 7 HCA COPYRIGHT 2003 ACS on STN
- 129:327094 Reactions of hypochlorous acid with biological substrates are activated catalytically by tertiary amines. Prutz, W. A. (Institut fur Biophysik und Strahlenbiologie, Universitat Freiburg, Freiburg, D-79104, Germany). Archives of Biochemistry and Biophysics, 357(2), 265-273 (English) 1998. CODEN: ABBIA4. ISSN: 0003-9861. Publisher: Academic Press.

AB The activation of reactions of HOCl with a variety of model substrates by tertiary amines was investigated spectroscopically by tandem-mix and stopped-flow techniques. HOCl-induced chlorination of salicylate can be sped up by several orders of magnitude by catalytic amts. of trimethylamine (TMN). The effect is obviously due to the fast generation of reactive quaternary chlorammonium ions, TMN+Cl, which act as chain carrier in a catalytic reaction cycle. Of various catalysts tested, quinine shows the highest activity; this is attributable to the quinuclidine (QN) substituent, a bicyclic tertiary amine, forming a particularly reactive chloro derivative, QN+Cl, which does not decompose autocatalytically. The rate of catalytic salicylate chlorination as a function of pH (around pH 7) depends not at least on the basicity of the tertiary amine; the rate increases with pH in the cases of TMN and quinuclidine (high basicity), but decreases with pH in the case of MES (low basicity). Tertiary amines also catalyze the interaction between HOCl and alkenes, as shown using sorbate as model. Reaction of HOCl with the nucleotides GMP and CMP is sped up remarkably by catalytic amts. of tertiary amines. In the case of GMP the same product spectrum is produced by HOCl in the absence and presence of catalyst, but a change in the product spectra is obtained when AMP and CMP are reacted with HOCl in presence of catalyst. Using poly(dA-dT) · poly(dA-dT) as DNA model, it is shown that HOCl primarily induces an absorbance increase at 263 nm, which indicates unfolding of the double strand due to fast chlorination of thymidine; a subsequent secondary absorbance decrease can be explained by slow chlorination of adenosine. Both the primary and secondary processes are activated by catalytic amts. of quinine. No evidence was found for a radical pathway in TMN-mediated oxidation of formate by HOCl. The present results suggest that low concns. of certain tertiary amines have the potential of modifying the spectrum of target mols. which can be damaged by HOCl in biol. systems. (c) 1998 Academic Press.

CC 4-3 (Toxicology)

IT pH (reactions of hypochlorous acid with biol. substrates are activated catalytically by tertiary amines in relation to pH)

IT 61-19-8, AMP, biological studies 63-37-6, CMP 64-18-6, Formic acid, biological studies 69-72-7, biological studies 85-32-5, GMP 110-44-1 7790-92-3, Hypochlorous acid

RL: BFR (Biological process); BSU (Biological study, unclassified); BIOL (Biological study); PROC (Process)

(reactions of hypochlorous acid with biol. substrates are activated

catalytically by tertiary amines)

IT 58-97-9, Ump, biological studies 60-31-1, Acetylcholine chloride 75-50-3, Trimethylamine, biological studies 100-76-5, Quinuclidine 107-35-7, Taurine 124-40-3, Dimethylamine, biological studies 130-95-0, Quinine 4432-31-9, 2-(N-Morpholino)ethanesulfonic acid

RL: BUU (Biological use, unclassified); BIOL (Biological study); USES (Uses)

(reactions of hypochlorous acid with biol. substrates are activated catalytically by tertiary amines)

L53 ANSWER 7 OF 7 HCA COPYRIGHT 2003 ACS on STN

78:97035 Molecular dynamics of acetylcholine and of choline. Behr, Jean Paul; Lehn, Jean Marie (Inst. Chim., Univ. Louis Pasteur, Strasbourg, Fr.). Biochemical and Biophysical Research Communications, 49(6), 1573-9 (English) 1972. CODEN: BBRC99. ISSN: 0006-291X.

GI For diagram(s), see printed CA Issue.

AB A Fourier-transformation 13C and 14N NMR study of the behavior of acetylcholine in solution was made. The local mol. motions and the

corresponding activation parameters at each C were obtained. The mol. conformation and the <sup>14</sup>N quadrupolar coupling constant, which reflects the elec. properties of the quaternary ammonium site, were determined. No complexation with either AMP, ATP or CMP, in the presence or absence of alkaline earth ions, could be detected.

CC 22-9 (Physical Organic Chemistry)

IT Nuclear magnetic resonance  
(carbon-13 and nitrogen-14, of acetylcholine and **choline bromide**, fourier transformation calcons. in relation to)

IT Mathematics  
(fourier transformation, for acetylcholine and **choline bromide**, NMR in relation to)

IT Conformation and Conformers  
Molecular association  
(of acetylcholine and **choline bromide**, NMR and fourier transformation in relation to)

IT 7727-37-9, properties  
RL: PRP (Properties)  
(NMR of nitrogen-14, in acetylcholine and **choline bromide**)

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These 2 records do not have relevant dates - I included them because there were so few records

\*\*\*\*\*

=> d L54 1-2 cbib abs hitind

L54 ANSWER 1 OF 2 HCA COPYRIGHT 2003 ACS on STN  
139:232219 Methods and compositions for chemically treating a substrate using foam technology. Patel, Bakul P.; Cernat, Mihaela Anca-mac; Small, Robert J. (USA). U.S. Pat. Appl. Publ. US 2003171239 A1 20030911, 28 pp. (English). CODEN: USXXCO. APPLICATION: US 2002-60109 20020128.

AB A method for treating a surface of a substrate by foam technol., particularly in removing undesired matter from the surface of substrates with small features, where such undesired matter may comprise organic and inorg. compds. such as particles, films from photoresist material, and traces of any other impurities such as metals deposited during **planarization** or etching, comprises generating a foam from a liquid composition, wherein the liquid composition comprises a gas; a surfactant; and

at least one component selected from the group consisting of a fluoride, a hydroxylamine, an amine and periodic acid; contacting the foam with the surface of a substrate; and, removing the undesired matter from the surface of the substrate.

IC ICM C11D017-00

NCL 510406000; 510412000; 510499000; 510411000

CC 46-6 (Surface Active Agents and Detergents)  
Section cross-reference(s): 76

IT 50-81-7, Ascorbic acid, uses 62-49-7D, Choline, derivative 62-49-7D, Choline, optionally derivative 64-18-6, Formic acid, uses 64-19-7, Acetic acid, uses 65-85-0, Benzoic acid, uses 75-59-2, Tetramethylammonium hydroxide 77-92-9, Citric acid, uses 78-73-9, **Choline bicarbonate** 79-09-4, Propionic acid, uses 79-31-2, Iso-butyric acid 87-69-4, Tartaric acid, uses 96-48-0 107-92-6, n-Butyric acid,

uses 110-15-6, Succinic acid, uses 110-91-8, Morpholine, uses 111-40-0, Di(ethylene triamine) 112-24-3, Tri(ethylene)tetramine 123-41-1, Choline hydroxide 124-38-9, Carbon dioxide, uses 141-82-2, Malonic acid, uses 144-62-7, Oxalic acid, uses 302-01-2, Hydrazine, uses 526-95-4, Gluconic acid 872-50-4, N-Methyl pyrrolidone, uses 929-06-6, Diglycol amine 1310-58-3, Potassium hydroxide, uses 1310-73-2, Sodium hydroxide, uses 1336-21-6, Ammonium hydroxide 1341-49-7, Ammonium bifluoride 3710-84-7, Di(ethyl)hydroxylamine 5080-22-8, Isopropyl hydroxylamine 6915-15-7, Malic acid 7440-37-1, Argon, uses 7440-59-7, Helium, uses 7664-39-3, Hydrogen fluoride, uses 7727-37-9, Nitrogen, uses 7782-44-7, Oxygen, uses 10028-15-6, Ozone, uses 12125-01-8, Ammonium fluoride 33667-48-0, Tris(2-hydroxyethyl)methylammonium hydroxide 56742-57-5, Bis(2-hydroxyethyl)dimethylammonium hydroxide 376354-25-5, EKC 640 444885-10-3, EKC 640D 573672-43-2, EKC 6800  
RL: TEM (Technical or engineered material use); USES (Uses)  
(methods and compns. for chemical treating a substrate using foam technol.)

L54 ANSWER 2 OF 2 HCA COPYRIGHT 2003 ACS on STN

139:158361 Methods and compositions for chemically cleaning a substrate using foam technology. Patel, Bakul P.; Cernat, Mihaela; Small, Robert J. (EKC Technology, Inc., USA). PCT Int. Appl. WO 2003064581 A1 20030807, 64 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English). CODEN: PTXXD2.  
APPLICATION: WO 2002-US3233 20020128.

AB The present invention relates to methods and compns. for treating a surface of a substrate by foam technol. that includes at least one treatment chemical. The invention more particularly relates to the removal of undesired matter from the surface of substrates with small features, where such undesired matter may comprise organic and inorg. compds. such as particles, films from photoresist material, and traces of any other impurities such as metals deposited during planarization or etching. A method accordingly for treating a surface of a substrate, comprises the following steps: (1) generating a foam from a liquid composition, wherein the liquid composition comprises a gas; a surfactant; and at least one component selected from the group consisting of a fluoride compound that is free of both of organoammonium and amine carboxylate compds., a hydroxylamine, an amine and periodic acid; (2) contacting the foam with the surface of a substrate; (3) removing the undesired matter from the surface of the substrate.

IC ICM C11D003-02

ICS C11D003-43; C11D003-20

CC 76-3 (Electric Phenomena)

Section cross-reference(s): 46

IT Semiconductor devices

(wafer; methods and compns. for chemical cleaning a substrate using foam technol.)

IT 50-81-7, Ascorbic acid, uses 62-49-7D, Choline, optionally derivative 64-18-6, Formic acid, uses 64-19-7, Acetic acid, uses 65-85-0, Benzoic acid, uses 75-59-2, Tetramethylammonium hydroxide 77-92-9, Citric acid, uses 78-73-9, Choline bicarbonate 79-09-4, Propionic acid, uses 79-31-2, Iso-butyric acid 87-69-4, Tartaric acid, uses 107-92-6, n-Butyric acid, uses 109-83-1 110-15-6, Succinic

acid, uses 110-91-8, Morpholine, uses 111-40-0, Di(ethylene triamine)  
112-24-3, Tri(ethylene)tetramine 123-41-1, Choline hydroxide  
123-41-1D, Trimethyl(2-hydroxyethyl)ammonium hydroxide, optionally derivative  
124-38-9, Carbon dioxide, uses 141-43-5, Monoethanolamine, uses  
141-82-2, Malonic acid, uses 144-62-7, Oxalic acid, uses 302-01-2D,  
Hydrazine, optionally salts 526-95-4, Gluconic acid 929-06-6, Diglycol  
amine 1310-58-3, Potassium hydroxide, uses 1310-73-2, Sodium  
hydroxide, uses 1336-21-6, Ammonium hydroxide 1341-49-7, Ammonium  
bifluoride 3710-84-7, Di(ethyl)hydroxylamine 5080-22-8, Isopropyl  
hydroxylamine 6915-15-7, Malic acid 7440-37-1, Argon, uses  
7440-59-7, Helium, uses 7664-39-3, Hydrogen fluoride, uses 7727-37-9,  
Nitrogen, uses 7782-44-7, Oxygen, uses 10028-15-6, Ozone, uses  
12125-01-8, Ammonium fluoride 13444-71-8, Periodic Acid 33667-48-0,  
Tris(2-hydroxyethyl)methylammonium hydroxide 56742-57-5,  
Bis(2-hydroxyethyl)dimethylammonium hydroxide 376354-25-5, EKC 640  
444885-10-3, EKC 640D 573672-43-2, EKC 6800  
RL: TEM (Technical or engineered material use); USES (Uses)  
(methods and compns. for chemical cleaning a substrate using foam  
technol.)

=> file wpix

FILE 'WPIX' ENTERED AT 09:39:45 ON 17 NOV 2003

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FILE LAST UPDATED: 12 NOV 2003 <20031112/UP>  
MOST RECENT DERWENT UPDATE: 200373 <200373/DW>  
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=> d L67 1-2 ti

\*\*\*\*\*  
This first record is the author's. The second record is a duplicate of  
a record in Chem. Abstracts

L67 ANSWER 1 OF 2 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN  
TI Polishing slurry, used for chemical mechanical  
polishing during manufacture of semiconductor devices, comprises

abrasive, deionized water, pH controlling agent and polyethylene imine.

L67 ANSWER 2 OF 2 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN  
TI Wafer **polishing slurry** for chemical mechanical  
**polishing** method, comprises several **polishing** particles,  
solvent in which **polishing** particles are suspended and  
quaternary ammonium compound contained in solvent.

=> file japio

FILE 'JAPIO' ENTERED AT 09:40:24 ON 17 NOV 2003  
COPYRIGHT (C) 2003 Japanese Patent Office (JPO)- JAPIO

FILE LAST UPDATED: 13 NOV 2003 <20031113/UP>  
FILE COVERS APR 1973 TO JULY 31, 2003

<<< GRAPHIC IMAGES AVAILABLE >>>

=> d L79 1-5 ti

L79 ANSWER 1 OF 5 JAPIO (C) 2003 JPO on STN  
TI SOLUTION FOR CHEMICAL MECHANICAL **POLISHING** AND METHOD THEREFOR

L79 ANSWER 2 OF 5 JAPIO (C) 2003 JPO on STN  
TI METHOD FOR PRODUCING CYTIDINE 5'-DIPHOSPHATE **CHOLINE**

L79 ANSWER 3 OF 5 JAPIO (C) 2003 JPO on STN  
TI FOURTH AMMONIUM BASE SEMICONDUCTOR SURFACE PROCESSING AGENT AND  
MANUFACTURE OF THE SAME

L79 ANSWER 4 OF 5 JAPIO (C) 2003 JPO on STN  
TI PRODUCTION OF CYTIDINE DIPHOSPHOCHOLINE

L79 ANSWER 5 OF 5 JAPIO (C) 2003 JPO on STN  
TI **POLISHING** OF SI **WAFER**

=> d L79 1,3,5 ibib abs ind

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This is the author's record

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L79 ANSWER 1 OF 5 JAPIO (C) 2003 JPO on STN  
ACCESSION NUMBER: 2002-305167 JAPIO  
TITLE: SOLUTION FOR CHEMICAL MECHANICAL **POLISHING**  
AND METHOD THEREFOR  
INVENTOR: LEE JAE-DONG; YOON BO-UN; HAH SANG-ROK  
PATENT ASSIGNEE(S): SAMSUNG ELECTRONICS CO LTD  
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
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JP 2002305167 A 20021018 Heisei H01L021-304

## APPLICATION INFORMATION

STN FORMAT: JP 2001-390104 20011221  
ORIGINAL: JP2001390104 Heisei  
PRIORITY APPLN. INFO.: KR 2000-200080715 20001222  
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined  
Applications, Vol. 2002

L79 ANSWER 3 OF 5 JAPIO (C) 2003 JPO on STN  
ACCESSION NUMBER: 1999-214373 JAPIO  
TITLE: FOURTH AMMONIUM BASE SEMICONDUCTOR SURFACE PROCESSING  
AGENT AND MANUFACTURE OF THE SAME  
INVENTOR: KATO CHI HARU; OYAMA RYUICHI; OTA YOSHIRO; SHIMIZU  
SHUNPEI  
PATENT ASSIGNEE(S): TAMA KAGAKU KOGYO KK  
TOSHIBA CORP  
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 11214373	A	19990806	Heisei	H01L021-308

## APPLICATION INFORMATION

STN FORMAT: JP 1998-12612 19980126  
ORIGINAL: JP10012612 Heisei  
PRIORITY APPLN. INFO.: JP 1998-12612 19980126  
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined  
Applications, Vol. 1999

AN 1999-214373 JAPIO  
AB PROBLEM TO BE SOLVED: To provide a new semiconductor surface processing agent of a fourth ammonium hydroxide base in which further superior preservation stability and surface permeability can be contained as the semiconductor surface processing agent substituted for choline, and the occurrence of the decomposition of free amine which is suitable for a following fine lithographic manufacturing line can be reduced sharply, and a method for manufacturing this.  
SOLUTION: This is a fourth ammonium base semiconductor surface processing agent including fourth ammonium hydroxide represented by an expression (where  $R<SB>1</SB>-R<SB>3</SB>$  each indicates an alkyl group the carbon number of which is 1-4, and (m) and (n) are integers 1-6, and (x) is an integer of 1-6) as valid components, and a method for manufacturing this. This semiconductor surface processing agent is made useful as a developer, peeling solvent, or cleaning solvent to be used for the semiconductor manufacturing process, and also made useful as the polishing solvent for chemical-mechanical polish(CMP) or post-processing cleaning solvent.  
COPYRIGHT: (C)1999,JPO  
IC ICM H01L021-308  
ICS C11D001-62; C23G001-14; G03F007-32; G03F007-42; H01L021-027; H01L021-304; H01L021-304; H01L021-306  
ICA C07C213-04; C07C217-08

L79 ANSWER 5 OF 5 JAPIO (C) 2003 JPO on STN  
ACCESSION NUMBER: 1983-087829 JAPIO  
TITLE: POLISHING OF SI WAFER

INVENTOR: TAKASU SHINICHIRO; HIRATSUKA HACHIRO; MURAOKA HISASHI  
PATENT ASSIGNEE(S): TOSHIBA CORP  
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 58087829	A	19830525	Showa	H01L021-304

## APPLICATION INFORMATION

STN FORMAT: JP 1981-186395 19811120  
ORIGINAL: JP56186395 Showa  
PRIORITY APPLN. INFO.: JP 1981-186395 19811120  
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined  
Applications, Vol. 1983

AN 1983-087829 JAPIO

AB PURPOSE: To prevent contamination of the Si wafer to be  
generated by metals of Na, Cu, etc., by a method wherein the Si  
wafer is polished using a polishing agent such

as choline aqueous solution added with pulverized powder of  
amorphous SiO<SB>2</SB>, etc.  
CONSTITUTION: The chemical agent containing no metal element of Na, Cu,  
etc., having the faculty to etch the proper quantity of Si, having the  
property not to etch a polishing device constituting structural  
material, and moreover not to dissolve pulverized powder of amorphous  
SiO<SB>2</SB>, etc., to be added, is used as the polishing  
material for mirror polish finishing of the Si wafer.  
Namely, when the Si wafer is to be mirror polish  
finished, the polishing agent such as choline aqueous  
solution added with pulverized powder consisting of amorphous  
SiO<SB>2</SB> is used. Concentration of choline of the  
polishing agent mentioned above is set to 0.2%~10%, and the  
adding quantity of pulverized powder is set to 200[g/l] or less.  
COPYRIGHT: (C)1983,JPO&Japio

IC ICM H01L021-304

=&gt; file compendex,inspec

\*\*\*\*\*  
I searched choline? and cmp etc. but didn't find any relevant art - I printed  
out the titles below.

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=&gt; =&gt; d L82 1-4 ti

L82 ANSWER 1 OF 4 INSPEC (C) 2003 IEE on STN

TI Molecular structures of cytidine-5'-diphosphate and cytidine-5'-diphospho-

choline, and their role in intermediary metabolism.

L82 ANSWER 2 OF 4 COMPENDEX COPYRIGHT 2003 EEI on STN

TI Molecular and biochemical characterization of an aminoalcoholphosphotransferase (AAPT1) from Brassica napus: Effects of low temperature and abscisic acid treatments on AAPT expression in Arabidopsis plants and effects of over-expression of BnAAPT1 in transgenic Arabidopsis.

L82 ANSWER 3 OF 4 COMPENDEX COPYRIGHT 2003 EEI on STN

TI Increased ethyl caproate production by inositol limitation in Saccharomyces cerevisiae.

L82 ANSWER 4 OF 4 COMPENDEX COPYRIGHT 2003 EEI on STN

TI Reduced adsorption of proteins at the phosphoryl choline incorporated polymer-water interface.

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